ILRI
International Livestock Research Institute
www.ilri.org

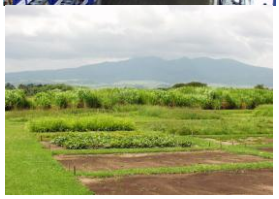
Forage diversity activities at the International Livestock Research Institute (ILRI)

Forage diversity

Poor-quality feed and fluctuating feed supplies with seasonal feed shortages are the major constraints to increasing livestock productivity in many tropical countries. Understanding and managing forage diversity is essential for development of new forage resources to alleviate these constraints and maintain diversity in forage/pasture ecosystems.

The knowledge generated from this work allows scientists to identify genotypes that have potential as livestock feed. It also allows them to find rational ways to conserve essential forage biodiversity for current and future generations as global public goods.

The ILRI genebank conserves about 19,000 accessions of forages from over 1000 species. This is one of the most diverse collections of forage grasses, legumes and fodder tree species held in any genebank in the world and includes the world's major collection of African grasses and tropical highland forages. In 1994, the germplasm collection held by ILRI was placed in trust under the auspices of the Food and Agriculture Organization of the United Nations (FAO) as part of their international network of ex situ collections. ILRI claims no ownership nor seeks any intellectual property rights over the germplasm and related information. In October 2006, ILRI signed an agreement to include this material under the International Treaty on Plant Genetic Resources for Food and Agriculture.



Forage genebank

ILRI aims to maintain a securely conserved diverse forage collection with related information and make them available as part of a rational global system of genetic resources conservation and sustainable use. ILRI maintains both an active and base genebank at its site in Addis Ababa. Seeds are stored at low seed moisture contents in laminated aluminum foil packets at 8° C for medium-term storage, research and distribution of seeds and at -20° C for long-term storage. ILRI ensures quality of the collection through monitoring viability and germplasm health. In addition, ILRI maintains field genebanks for grasses that rarely produce seeds or whose seeds are short-lived at Zwai and Debre Zeit in Ethiopia. Seeds of ILRI's own collections are being sent to the Centro Internacional de Agricultura Tropical (CIAT) in Colombia and the Svalbard Global Seed Vault in Norway for safety duplication.

Forage research

The major focus of our research is to characterize the forage resources for use as livestock feeds. This involves assessing variation in phenotype and nutritional traits, as well as resistance to diseases and pests. Genetic diversity is also studied using molecular techniques. Research also covers disease and drought tolerance studies. Recent work has focused on identification of Napier grass accessions with tolerance to Napier grass stunt disease and drought. Information generated from this research is used to identify superior accessions or best bets for further agronomic evaluation and utilization as part of sustainable farming systems.

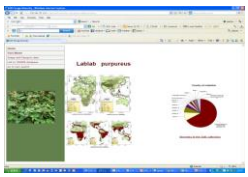
Use of forages

In addition to providing feeds, forages have a key role in enhancing natural assets through positive effects on soil fertility, increasing ground cover with associated benefits (biodiversity, carbon sequestration) for improving system resilience. They are an important land use strategy for marginal lands and steep slopes that are not suitable for crop production.

Two accessions from the ILRI in trust collection of Napier grass with resistance to smut disease are being used widely in Kenya, while accessions of the fodder tree *Sesbania* have already been widely adopted by farmers in the highlands of sub-Saharan Africa, especially as part of smallholder dairy systems.

Managing and sharing knowledge

In order to promote use and adoption of forages, ILRI has posted information about the accessions held in the genebank on its web page and, in collaboration with the Commonwealth Scientific and Industrial Research Organization (CSIRO) and CIAT, has developed an interactive information and selection tool for tropical forages. ILRI has also produced information sheets on some key forage species for translation into local languages. Recently, the team at ILRI has been involved in the development of a knowledge sharing platform for genebanks (Crop Genebank Knowledge Base), a forage registry of available forage accessions in the world's forage genebanks and development of a web site to share information on Napier grass stunt and smut diseases.



http://192.156.137.110/forage/frgdsearch.asp

www.tropicalforages.info

www.cropgenebank.sgrp.cgiar.org

http://icarda-genebank.icarda.cgiar.org/crs/forage/public//

http://sites.google.com/site/napiergrassdiseaseresistance/home

Services and training

Every year, ILRI freely distributes about 3,000 samples of germplasm globally for evaluation and further development and use by smallholder farmers. ILRI also maintains the Herbage Seed Unit which focuses on providing a source of tropical forage seeds and planting material of selected best-bet species at cost for use in establishing national forage seed production, including 33 species of herbaceous legumes, 10 species of grass and 5 species of fodder trees.

ILRI has laboratories in Ethiopia to support its research in seed processing, germination, taxonomy, cytology, disease diagnostics, nutrition and molecular studies. These facilities are available on a cost recovery basis for ILRI and other CGIAR projects, collaborative research projects with partners and ILRI graduate and technical associates.

To strengthen the research capacity of institutions in developing countries, ILRI provides group training for national programme scientists in germplasm management and seed production and individual training for associates and interns. Training manuals for forage seed production and seed handling in genebanks have been developed to support these activities.

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